

(Experiment No. 29) needs a larger operating force; and the transparent electro conductive layer was observed to be broken.

The touch panels comprising dot spacers made of silicone resin (Experiment Nos 27, 28) have a shorter operating life; and show peeling off of the dot spacers.

#### Embodiment 5

Liquids have been prescribed to contain modified epoxy compound, bisphenol type epoxy compound, curing agent, organic polymer compound and inorganic filler with the proportions as specified in Table 6. Using the liquid mixture thus obtained, touch panels have been fabricated using the same method as in Embodiment 1.

Each of the touch panels has been measured with respect to the following characteristics or items: the force needed to operate, operating life, occurrence of breakage in the transparent electro conductive layer, peeling off of the dot spacer, etc. The results are shown in Table 6.

TABLE 6

	experiment No.	30	31	32	33	34	35
modified epoxy compound (wt %)	TSR-930	49	68	—	—	—	—
	EPIKOTE-871	—	—	72	44	—	—
	EX-931	—	—	—	—	71	48
ordinary epoxy compound (wt %)	EPIKOTE-828	29	0	0	36	—	34
curing agent (wt %)	trimethylamino-methylphenol (DMP-30)	12	9	8	10	7	8
filler (wt %)	silica powder	10	13	—	—	12	—
	talc powder	—	10	—	—	—	—
	calcium carbonate powder	—	—	10	—	10	—
organic polymer compound (wt %)	polyamide powder	—	—	—	—	—	10
	silicone resin powder	—	—	—	10	—	—
	rubber solution	—	—	10	—	—	—
hardness of dot spacer (ASTM D2240)	JIS K6301 A-type	93	80	76	82	70	75
characteristics of transparent touch panel	operating force (Newton)	1.4	1.1	1.2	1.1	1.2	1.1
	operating life (touches)	over 2 mil.	over 2 mil.	over 2 mil.	over 2 mil.	over 2 mil.	over 2 mil.
	broken electro conductive layer	no	no	no	no	no	no
	peeled off dot spacer	no	no	no	no	no	no

According to the results shown in Table 6, the touch panels, comprising dot spacers having a hardness which is below 95 (Experiment Nos. 30–35), need a small force for operating; have an operating life of more than 2 million touchings; show no breakage in the transparent electro conductive layer; and show no peeling off of the dot spacers.

In the Embodiments 1–5, dot spacers 5 have been formed on the base plate 1. However, dot spacers 5 may be formed on electro conductive layer applied to the top plate 2 to obtain the same effect.

As described in the above mentioned Embodiments, the transparent touch panels, comprising dot spacers made of composite resin containing flexible modified epoxy resin provide the following functions and effects: Because of the fact that the dot spacer has a high degree of elasticity, the input operation or pressing of the top plate can be performed by softly touch-pressing the panel surface. After repeated touchings, the permanent deformation of the dot spacer is very small, and the operating durability is remarkably improved. Because of the alleviated or decreased operating force, the possible breakage of transparent electro conductive layer placed on the top plate is significantly preventable.

Further, because of the high adhesion strength of the dot spacers, the peeling off of the dot spacers is avoidable. With the constitution according to this invention, a transparent touch panel that offers such outstanding characteristics as described in the foregoing descriptions is implemented.

It is especially preferred to comprise such dot spacers having a hardness which is not more than 95 according to JIS-A test method (not more than 95 according to ASTM-D2240). By so doing, more enhanced advantages may be obtained.

What is claimed is:

1. A transparent touch panel comprising:

(a) a base plate having a first transparent electro conductive layer on one of the surfaces thereof;

(b) a top plate having a second transparent electro conductive layer on one of the surfaces thereof, wherein said base plate and said top plate are combined so that said first transparent electro conductive layer and said

second transparent electro conductive layer face each other securing a certain specified clearance; and

(c) a plurality of dot spacers located in between said base plate and said top plate, said dot spacers made of a composite resin including a flexible modified epoxy resin,

wherein a pressure given from the other surface of said top plate makes said second transparent electro conductive layer placed on said top plate touch said first transparent electro conductive layer placed on said base plate to indicate a place where said pressure is given, wherein each of said plurality of dot spacers is installed at a certain interval and with a predetermined height in order to insure a clearance between said base plate and said top plate,

wherein said modified epoxy resin is a resin created through a chemical reaction between a curing agent and at least one modified epoxy compound selected from the group consisting of rubber-modified epoxy compound, polyether-modified epoxy compound, fatty-